

Microzooplankton in a changing environment: shifts in phenology and trophic relations

N. Aberle^{1,2}, H.G. Horn², A.M. Lewandowska³, and U. Sommer⁴

¹ Norwegian University of Science and Technology, Trondheim Biological Station, 7491 Trondheim, Norway

² Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Biologische Anstalt Helgoland, Postfach 180, 27483 Helgoland, Germany

³ Institute for Chemistry and Biology of the Marine Environment (ICBM-Terramare), Carl von Ossietzky University of Oldenburg, Schleusenstrasse 1, 26382 Wilhelmshaven, Germany

⁴ GEOMAR Helmholtz Centre for Ocean Research, Düsternbrooker Weg 20, 24105 Kiel, Germany

Abstract

Changing environmental conditions are considered to alter microzooplankton (MZP) biomass and community composition with potential impacts on trophic relations in the plankton. This is especially true for future ocean scenarios since global warming considerably affects heterotrophic processes and ocean acidification (OA) is likely to alter primary producers and consumers either directly or indirectly. Here we present the results of several indoor mesocosm experiments on the responses of natural plankton communities to future ocean conditions, which we performed over the past 10 years. The data demonstrates the crucial role of MZP as a trophic intermediary between phytoplankton and mesozooplankton and points at recurrent patterns e.g. changes in phenology and reduced time-lags between phytoplankton and microzooplankton in relation to warming. The distinct roles of ciliates as a ‘trophic link’ between microbial and classical food webs and the potential of heterotrophic dinoflagellates to act as a ‘trophic sink’ due to an enhanced feeding competition with mesozooplankton will be addressed. Further, alterations in trophic transfer up the food-web as well as potential consequences for pelagic ecosystems under future ocean conditions will be discussed in detail.

Session: The role of microzooplankton in marine food webs (ICES/PICES 6th Zooplankton Production Symposium, 2016)